

REMARKS

Claims 1, 3, 4 and 6 through 32 and new Claim 33 are pending in the application.

Claim 1 has been amended to remove the term "the coating contains a maximum of 5% by weight cellulosic filler" deemed extraneous to patentability.

Claim 1 has also been amended to reflect advantageous food casings in which the reinforcement consists of a consolidated nonwoven fabric, spunbonded fabric or fibrous paper. Support for this amendment can be found in the Application-as-filed, for example on Page 4, lines 3 through 4 and on Page 5, line 3.

Claim 25 has been amended to reflect expedient casings that incorporate coating consisting of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional further natural and/or synthetic polymers, (iv) optional secondary plasticizer, (v) optional dye and/or pigments and (vi) if the protein is water-soluble then at least one compound which crosslinks the protein. Support for this amendment can be found in the Application-as-filed.

Claim 27 has been amended to reflect beneficial food casings consisting of reinforcement and a single coating, in which the coating uniformly coats the reinforcement. Support for this amendment can be found in the Application-as-filed, for example on Page 3, lines 25 through 28.

Claim 27 has also been amended to reflect advantageous inventive casings having a minimum weight per unit area of 78 g/m^2 . Support for this amendment can be found in the Application-as-filed, for example on Page 16, lines 21 through 22.

Claim 31 has been amended to reflect advantageous embodiments in which the the reinforcement has a weight per unit area of $10 \text{ to } 130 \text{ g/m}^2$ and the dried coating has a weight per unit area of $60 \text{ to } 92 \text{ g/m}^2$. Support for this amendment can be found in the Application-as-filed, for example on Page 5, lines 1 through 2; Page 13, lines 17 through 18 and Page 14, lines 10

through 13 (based on a dried casing weight per area of 150 g/m^2 minus the support material weight per unit area of 58 g/m^2).

Claim 33 has been added to complete the record for examination and highlight advantageous embodiments of the invention. Claim 33 is directed to expedient aspects in which the protein is collagen. Support for Claim 32 can be found in the Application-as-filed, for example on Page 5, lines 26 through 27.

Applicants respectfully submit that this response does not raise new issues, but merely places the above-referenced application either in condition for allowance, or alternatively, in better form for appeal. Reexamination and reconsideration of this application, withdrawal of all rejections, and formal notification of the allowability of the pending claims are earnestly solicited in light of the remarks which follow.

Section 112 Rejection

Claim 32 stands rejected over the recitation "inedible." Applicants respectfully submit that one skilled in the art would clearly implicitly understand that food casings incorporating reinforcement have a weight per unit area of 3 to 400 g/m^2 are inherently inedible, particularly such casings in which the reinforcement consists of a consolidated nonwoven fabric, spunbonded fabric or fibrous paper. Applicants further respectfully submit that one skilled in the art would base this assumption not upon the casings lack of palatability (which would arguably be considered subjective) but instead upon the understanding that the mastication and swallowing of the recited fabrics and paper would be difficult, if not impossible. In that regard, Applicants respectfully submit that cited secondary reference US 783 expressly teaches at Col. 3, lines 53 through 54, that short pulp fibers (presumably such as the fiber found in yogurts and the like) are not digestible and may be added to increase casing strength. Consequently, one skilled in the art would clearly expect that casings incorporating fiber of sufficient length and size to form the recited nonwoven fabrics or paper having a weight up to 400 g/m^2 would have a sufficiently

elevated strength to be inedible and would further not be digestible. Accordingly, Applicants respectfully request withdrawal of the foregoing rejection.

Claim 32 apparently further stands rejected over a lack of support for the recited cellulosic filler level. Without addressing the merits of the rejection and solely to advance prosecution of the above-referenced case, Claim 1 (from which Claim 31 depends) has been amended to remove the foregoing phrase.

*The Claimed Invention is Patentable
in Light of the Art of Record*

Claims 1, 3, 4, 6 through 8, 10 through 17 and 19 through 29 stands rejected over United States Patent No. 5,043,194 (US 194) to Siebrecht et al and WIPO Publication WO 98/34490, whose United States equivalent is United States Patent No. 6,902,783 (US 783). Claim 9 stands rejected over US 194 and US 783 in view of United States Published Application No. 2002/0064580 (US 580) to Gord et al. Claim 18 stands rejected over US 194 and US 783 in view of United States Patent No. 5,955,126 (US 126) to Jon et al.

It may be useful to briefly consider the invention before addressing the merits of the rejection.

Applicants respectfully reiterate that cellulosic food casings have long been known in the art. Processes by which to form cellulosic food casings generally involve extruding a solution of either viscose-cellulose or NMMO-cellulose. Unfortunately, the formation of cellulosic food casings is both expensive and environmentally challenging.

Altogether unexpectedly, Applicants have found food casings which can be produced simply, inexpensively, and in an environmentally friendly manner.

Applicants have more particularly determined that casings formed from fibrous web reinforcements that have merely been coated with a film-forming-protein composition can be produced simply and inexpensively. The inventive coatings, present on at least one side of the reinforcement, permeates the reinforcement, as recited in Claim 1, providing superior bonding. If the film-forming protein is water-soluble, the coating also incorporates at least one compound to crosslink the protein. Advantageously, the fibrous support web has a weight per unit area of 3 to 400 g/m² and consists of a consolidated nonwoven fabric, spunbonded fabric or fibrous paper, as recited in Claim 1 as-amended.

In especially advantageous aspects, the inventive coating consists of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional further natural and/or synthetic polymers, (iv) optional secondary plasticizer, (v) optional dye and/or pigments and (vi) if the protein is water-soluble then at least one compound which crosslinks the protein, as recited in Claim 25 as-amended.

In particularly beneficial aspects, the inventive food casings consist of reinforcement and a single coating, in which the coating uniformly coats the reinforcement and the resulting casing has a weight per unit area of 78 to 200 g/m² and exhibits a water vapour permeability of 300 to 1500 g/m²d, as recited in Claim 27 as-amended.

In especially expedient embodiments the reinforcement has a weight per unit area of 10 to 130 g/m² and the dried coating has a weight per unit area of 60 to 92 g/m², resulting in inventive casings exhibiting an extension ranging between 0.1 and 5 % in the longitudinal and transverse directions and water permeability ranging from about 10 to 100 l/m²d at 40 bar, as recited in Claim 31 as-amended.

Applicants respectfully reiterate that the cited references do not teach or suggest the claimed invention.

US 194 is directed to cellulosic casings having a “decorative surface texture” that are produced via the conventional viscose process. (Col. 1, lines 55 – 65; Col. 4, lines 25 – 27 and 61 through 64 and Col. 6, lines 1 - 2). The decorative surface texture is imparted by a “textile sheet-shaped structure,” defined as either a woven fabric, scrim or knitted fabric. (Col. 2, lines 40 – 45 and 54 - 56). Woven fabrics and scrims are defined as having at least two thread systems crossing each other at right angles. (Col. 2, lines 45 – 46). Knit fabrics are defined as being formed from meshes having a polygonal form. (Col. 2, lines 48 – 51). The textile is disposed in such a way that the woven or knitted texture is visible on the outer surface of the casing. (Col. 2, lines 57 – 60). US 194 notes that its casings may additionally contain further reinforcement, resulting in a composite structure. (Col. 4, lines 39 – 43). US 194 notes that that its textile structure may be coated on both sides with viscose. (Col. 2, line 63 – 64). The working examples of US 194 are coated on both sides with viscose cellulose. (Col. 5, lines 40 – 45 and Col. 5, lines 60 – 65).

US 194, directed solely to cellulose casings formed via the viscose cellulose process, does not teach or suggest the inventive casings in which protein permeates the reinforcement, as recited in Claim 1. Applicants respectfully reiterate that to modify US 194 so as to avoid its viscose process would altogether change the principle of operation for US 194.

And US 194 most certainly does not teach or suggest inventive casings in which the reinforcement consists of a consolidated nonwoven fabric, spunbonded fabric or fibrous paper. Applicants respectfully submit that to modify US 194 so as to avoid its required woven, knit or scrim would render it unsuitable for its intended purpose. US 194 instead merely notes that further reinforcement may be included within its casings in addition to the required woven, scrim or knit fabric, in contrast to the urgings of outstanding Office Action on Page 15, Ref. No. 44. Applicants additionally respectfully reiterate that there would have been absolutely no motivation to have formed a casing incorporating reinforcement consisting of consolidated nonwoven fabric, spunbonded fabric or fibrous paper in light of US 194, as there would have been no expectation of success in producing its required “decorative” sausage.

And US 194 most certainly does not teach or suggest the inventive coatings consisting of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional further natural and/or synthetic polymers, (iv) optional secondary plasticizer, (iv) optional dye and/or pigments and (v) if the protein is water-soluble then at least one compound which crosslinks the protein, as recited in Claim 25 as-amended.

Nor does US 194 teach or suggest that inventive food casings consisting of reinforcement and a single protein-containing coating, in which the coating uniformly coats the reinforcement and the casing has a weight per unit area of 78 to 200 g/m², would result in a casing exhibiting a water vapour permeability of 300 to 1500 g/m²d, as recited in Claim 27 as-amended.

US 194 similarly fails to teach or suggest that inventive casings formed from a protein-coated reinforcement in which the reinforcement has a weight per unit area of 10 to 130 g/m² and the dried coating has a weight per unit area of 60 to 92 g/m² would result in casings exhibiting both an extension ranging between 0.1 and 5 % in the longitudinal and transverse directions and water permeability ranging from about 10 to 100 l/m²d, as recited in Claim 31 as-amended.

Accordingly, Applicants respectfully reiterate that US 194 does not teach or suggest the claimed invention.

Applicants likewise respectfully reiterate that US 783 similarly fails to teach or suggest the inventive casings.

Applicants particularly respectfully reiterate that US 783 is directed to extruded, edible films, i.e. "edible shaped bodies," formed from a thermoplastic composition. (Col. 1, lines 37 through 40; Col. 1, lines 52 – 67; Col. 2, lines 38 – 41 and Col. 4, lines 26 - 30). The thermoplastic composition includes biopolymer, plasticizer, crosslinker, and at least one lubricant. (Col. 1, lines 57 – 60). The lubricant, present in amounts of up to 30 % by weight, renders the thermoplastic composition "soft and flowable." (Col. 3, lines 10 – 11 and Col. 4, lines 7 - 9).

The casings of US 783 are extruded through a ring die followed by blowing or are extruded through a slit-shaped die followed by stretching. (Col. 2, lines 18 – 23 and Col. 4, lines 26 – 29). The stretching or blowing step imparts mechanical strength to the shaped body. (Col. 2, lines 28 – 30). US 783 expressly teaches that “[c]ollagen is unsuitable” as a biopolymer. (Col. 2, lines 52 – 53). To further strengthen the films, the biopolymer blends may further include wood pulp or the like within its extrudable mass, presumably in edible quantities. (Col. 3, lines 44 – 46). Although the vast majority of working examples do not include wood pulp, Example 1 does include a modest amount such fibers within its extrusion blend. (Col. 5, lines 1 – 18) The wood pulp fibers of US 783 are very short, having a length of at most 5 mm, preferably at most 2 mm. (Col. 3, lines 48 – 50). US 783 expressly teaches that such pulp fibers are “not digestible” and may be used to strengthen the casing. (Col. 3, lines 43 – 44 and 53 – 54). The films of US 783 are also expressly indicated to have “low liquid - ... permeability.” (Col. 5, lines 33 – 35). The working examples of US 783 appear to range in weight per area from 38 to 48 gm²/m and further exhibit an elongation of from 12 to 15% longitudinally and from 20 to 26 % transversely. (Col. 5, line 21 – Col. 7, line 38 and Claim 1).

Applicants respectfully reiterate that US 783, solely directed to extruded films, does not teach or suggest the claimed food casings formed from coated reinforcement. Applicants further respectfully reiterate that to modify US 783 so as to avoid its extrusion process would altogether change its principle of operation. Applicants further respectfully submit that the recited coating applied to reinforcement does, in fact, represent a significant structural difference in comparison to the extruded films of US 783 in contrast to the urgings within the outstanding Office Action on Page 15, Ref. No. 46. Applicants further respectfully reiterate that, inter alia, the rheological properties of polymer compositions suitable for extrusion versus coatings are altogether different.

Applicants additionally respectfully reiterate that US 783 thus cannot teach or suggest such inventive casings incorporating coated reinforcement consisting of the recited nonwoven fabrics and paper, as recited in Claim 1 as-amended. Applicants respectfully submit that US 783 instead merely indicates that its biopolymer blends may further include wood pulp. Applicants further respectfully reiterate that to modify US 783 so as to incorporate the recited nonwoven

fabrics or paper would clearly render it unfit for its intended purpose as an extruded, edible sausage casing. Hence there would have been no motivation to have done so.

And US 783 most certainly does not teach or suggest the inventive coatings consisting of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional further natural and/or synthetic polymers, (iv) optional secondary plasticizer, (v) optional dye and/or pigments and (vi) if the protein is water-soluble then at least one compound which crosslinks the protein, as recited in Claim 25 as-amended. Applicants respectfully submit that to modify US 783 so as to avoid its required lubricant would clearly render it unfit for its intended purpose as an extruded film casing. Applicants additionally respectfully submit that there would have been absolutely no motivation to have eliminated the required lubricant from US 783, as such compositions would not be expected to be sufficiently flowable for use as extrusion blends. Applicants further respectfully submit that a significant compositional difference, i.e. the lack of both lubricant, and a significant structural difference, i.e. the recited coatings versus the cited films, are clearly present within the embodiments of Claim 25 in comparison to US 783, in contrast to the urgings of the outstanding Office Action on Page 15, Ref. No. 46.

Nor does US 783 teach or suggest that inventive food casings consisting of reinforcement and a single coating based on protein, in which the coating uniformly coats the reinforcement and the resulting casing has a weight per unit area of 78 to 200 g/m² after drying would exhibit a water vapour permeability of 300 to 1500 g/m²d, as recited in Claim 27 as-amended. In contrast, US 783 instead clearly teaches that its far thinner casings that range in weight per unit area from 38 to 48 gm²/m and have low permeability.

US 783 similarly fails to teach or suggest that casings formed from protein coated reinforcement in which the reinforcement has a weight per unit area of 10 to 130 g/m² and the dried coating has a weight per unit area of 60 to 92 g/m² would exhibit an extension ranging between 0.1 and 5 % in the longitudinal and transverse directions and water permeability ranging up to 100 l/m²d, as recited in Claim 31 as-amended. US 783 instead clearly teaches thinner, far

more extensible casings that range in weight per unit area from 38 to 48 gm²/m, exhibit a minimum elongation of 12 % and further have a low liquid-permeability.

US 783 also fails to teach or suggest the inedible casings of Claim 32. Applicants respectfully reiterate that US 783 instead teaches away from such embodiments by clearly requiring that its casings be edible. Applicants further respectfully reiterate that to modify US 783 so as to form inedible films would clearly render it unfit for its intended purpose.

And US 783, clearly stating that collagen is “unsuitable”, cannot teach or suggest expedient aspects in which the protein is collagen, as recited in newly added Claim 33.

Accordingly, Applicants respectfully reiterate that the claimed invention is patentable in light of US 783, considered either alone or in any combination with the remaining art of record.

There would have been no motivation to have combined US 194, directed to casings formed via the viscose process, and US 783, directed to edible casings formed by thermoplastic extrusion. However, even if Applicants had combined US 194 and US 783 (which Applicants did not do), the claimed invention simply would not have resulted.

The combination simply cannot teach or suggest the inventive casings in which a protein coating permeates reinforcement consisting of a consolidated nonwoven fabric, spunbonded fabric or fibrous paper, as recited in Claim 1 as-amended. US 194 clearly requires either a woven fabric, scrim or knit fabric. US 783 merely teaches wood pulp. Consequently, the combination would have at best resulted in a casing incorporating either a woven fabric, scrim or knit fabric and optional wood pulp. To conclude otherwise is to indulge in a hindsight analysis that clearly disregards the very impetus of the primary reference.

And the combination likewise fails to teach or suggest the inventive coatings consisting of (i) protein, (ii) optional inorganic and/or organic filler, (iii) optional further natural and/or synthetic polymers, (iv) optional secondary plasticizer, (v) optional dye and/or pigments and (v)

if the protein is water-soluble then at least one compound which crosslinks the protein, as recited in Claim 25 as-amended. Applicants respectfully submit that there would have been absolutely no expectation of success in forming suitable protein coatings in the absence of the lubricant required in US 783. US 194, directed solely to cellulose casings, does not cure this deficiency.

The combination likewise fails to teach or suggest that inventive food casings consisting of a reinforcement with a single coating having a casing weight per unit area of 78 to 200 g/m² would exhibit a water vapour permeability of up to 1500 g/m²d, as recited in Claim 27 as-amended. Applicants respectfully submit that Claim 27 as-amended clearly avoids both the porosity and the barrier layer urged within the outstanding Office Action on Page 10, Ref. No. 29. Applicants further respectfully submit that US 783 instead indicates that its far thinner extruded protein casings have low permeability.

The combination similarly fails to teach or suggest that casings formed from protein coated reinforcement in which the reinforcement has a weight per unit area of 10 to 130 g/m² and the dried coating has a weight per unit area of 60 to 92 g/m² would exhibit an extension ranging between 0.1 and 5 % in the longitudinal and transverse directions and water permeability ranging up to 100 l/m²d, as recited in Claim 31 as-amended. US 194, directed solely to cellulosic films, does not teach or suggest the extensibility or water permeability of protein-based casings. US 783 clearly teaches thinner, far more extensible casings that range in weight per unit area from 38 to 48 g/m², exhibit a minimum elongation of 12 % and further have a low liquid-permeability

The combination also fails to teach or suggest the inedible casings of Claim 32.

And the combination cannot teach or suggest expedient aspects in which the protein is collagen, as recited in newly added Claim 33. US 783 instead expressly teaches that collagen is "unsuitable." US 194, solely directed to cellulose casings, does not cure this deficiency.

Accordingly, Applicants respectfully submit that US 194 and US 783 do not teach or suggest the claimed invention, considered either alone or in combination.

Claim 9 is likewise patentable in further light of US 580.

US 580 is directed to cellulose-based food casings, particularly cellulose-based food casings obtained in an amine oxide process. [0017]. In the process, a solution of cellulose in a monohydrate of N-methyl-morpholine-N-oxide (NMMO) is prepared, a surface-modifying additive and an internal-structure-changing additive are added to the solution and the mixture is then shaped into a tubular casing. [0013 and 0027]. The surface-modifying additive may be selected from any of a generic list, including paraffin, and is present in amounts as low as 0.2 % by weight. [0014 and 0020] The structure-modifying agent may similarly be selected from any of a generic list, including polyester and fatty acids. [0021] The cellulose-based casings of US 580 include at least 50% by weight of cellulose or cellulose derivatives. [0018]

US 580, directed to cellulose casings incorporating any of a number of structure-modifying additives, does not teach or suggest the inventive protein-based coatings, as recited in the claimed invention. Nor would there have been any expectation that the structure-modifying additives of US 580, incorporated into NMMO-cellulose compositions, would be compatible with the recited protein-based coatings.

US 194 and US 783 do not teach or suggest the claimed invention, based upon the reasoning provided above.

There would similarly have been no motivation to have combined US 194, US 783 and US 580. However, even if Applicants had combined US 194, US 783 and US 580 (which Applicants did not do), the claimed invention would not have resulted.

This combination similarly does not teach or suggest the inventive casings in which protein coating permeates the reinforcement, as recited in Claim 9. US 194 is directed solely to

cellulose casings formed via the viscose cellulose process. US 580 is directed to cellulose casings formed via an NMMO cellulose process. US 783 is solely directed to extruded films.

Nor does the combination teach or suggest inventive casings in which the reinforcement consists of a consolidated nonwoven fabric, spunbonded fabric or fibrous paper, as recited in Claim 9 as-amended. Applicants respectfully reiterate that to modify that to modify so as to avoid its required woven, knit or scrim would render it unfit for its intended purpose.

And the combination most certainly does not teach or suggest the inventive casings in which a protein-based coating permeating the reinforcement contains further natural or synthetic polymer selected from a poly-acrylate, polyvinyl acetate and/or a (co)polymer having units of vinyl acetate and/or units of saponified vinyl acetate (vinyl alcohol), as recited in Claim 9. US 580 merely provides a generic list of structure-modifying additives, such as polyester, that may be incorporated into a cellulosic composition.

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 194, US 783 and US 580, considered either alone or in any combination.

Claim 18 is similarly patentable in further light of US 126.

US 126 is directed to self-coloring food casings, which may be formed from either cellulose or any of a number of synthetic polymers, with regenerated cellulose casings being preferred. (Col. 10, lines 18 - 38). The impetus of US 126 is the formation of a colorant coating that has a "preferential substantivity" to proteinaceous foodstuffs. (Col. 8, lines 13 - 16). The casings of US 126 incorporate a transferable coating that contains a bixin colorant. (Col. 9, lines 8 - 11). The transferable colorant coating further includes a soluble film-forming agent selected from any of a generic list of materials, with cellulose ether preferred. (Col. 8, lines 16 - 23). US 126 expressly notes that moisture solubilizes the film forming agent, thereby releasing the bixin dye pigment during subsequent processing. (Col. 12, lines 55 - 62). In fact, the soluble film

forming agent is noted on several occasions as performing a transfer/release function for the colorant. (Col. 13, line 65 – Col. 14, line 2).

Applicants respectfully submit that US 126, directed to conventional food casings having a color transfer coating, does not teach or suggest the inventive casings food casings formed from a protein-coated reinforcement.

US 194 and US 783 do not teach or suggest the claimed invention, based upon the reasoning provided above.

There would similarly have been no motivation to have combined US 194, US 783 and US 126. However, even if Applicants had combined US 194, US 783 and US 126 (which Applicants did not do), the claimed invention would not have resulted.

The combination simply cannot teach or suggest the inventive casings in which a protein coating permeates reinforcement consisting of a consolidated nonwoven fabric, spunbonded fabric or fibrous paper, as recited in Claim 1 as-amended. US 194 clearly requires either a woven fabric, scrim or knit fabric. US 783 merely teaches wood pulp. US 126 does not cure the deficiencies in the foregoing references.

Accordingly, Applicants respectfully submit that Claim 18 is similarly patentable in light of US 194, US 783 and US 126, considered either alone or in any combination.

CONCLUSION

It is respectfully submitted that Applicants have made a significant and important contribution to the art, which is neither disclosed nor suggested in the art. It is believed that all of pending Claims 1, 4 and 6 through 33 are now in condition for immediate allowance. It is requested that the Examiner telephone the undersigned if any questions remain to expedite examination of this application.

It is not believed that extensions of time or fees are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time and/or fees are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required is hereby authorized to be charged to Deposit Account No. 50-2193.

Respectfully submitted,



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